30

CLAIMS

- 1. Use of compound which is an imidazoquinoline amine, imidazopyridine amine, 6,7-fused cycloalkylimidazopyridine amine, 1,2-bridged imidazoquinoline amine, thiazolo- and oxazolo-quinolinamine or pyridinamine, imidazonaphthyridine or tetrahydroimidazonaphthyridine amine in the manufacture of a medicament to enhance an immune response to an antigen, wherein the compound is administered topically or transdermally to the individual 12 to 36 hours after a nucleic acid vaccine is administered, and wherein the nucleic acid vaccine comprises a nucleotide sequence that encodes an HIV-1 gag protein or fragment containing a gag epitope thereof and a second HIV antigen or a fragment encoding an epitope of said second HIV antigen, operably linked to a heterologous promoter.
- 2. Use of a nucleotide sequence that encodes an HIV-1 gag protein or fragment containing a gag epitope thereof and a second HIV antigen or a fragment encoding an epitope of said second HIV antigen, operably linked to a heterologous promoter in the manufacture of a nucleic acid vaccine, wherein 12 to 36 hours subsequent to the administration of the nucleic acid vaccine to an individual a compound which is an imidazoquinoline amine, imidazopyridine amine, 6,7-fused cycloalkylimidazopyridine amine, 1,2-bridged imidazoquinoline amine, thiazolo- and oxazolo-quinolinamine or pyridinamine, imidazonaphthyridine or tetrahydroimidazonaphthyridine amine is administered topically or transdermally to the individual.
- 3. Use according to claim 1 or 2 wherein the compound is an imidazoquinoline.
 - 4. Use according to claim 1 or 2 wherein the compound is imiquimod or resiguimed.
 - 5. Use according to any one of the preceding claims wherein the nucleic acid

5

20

25

vaccine is administered topically or transdermally.

- 6. Use according to any one of the preceding claims wherein the nucleic acid vaccine is administered in the form of particles.
- 7. Use according to any one of the preceding claims wherein the compound is administered in the form of particles.
- 8. Use according to claim 6 or 7 wherein the nucleic acid vaccine or compound is coated on a core carrier.
 - 9. Use according to any one of claims 6 to 8 wherein the nucleic acid vaccine or compound is administered using a needless syringe.
- 15 10. Use according to any one of the preceding claims in which the compound is administered in the form of a cream
 - 11. Use according to any one of the preceding claims wherein the administration of the antigen or polynucleotide is repeated to provide a prime and booster administration.
 - 12. Use according to any one of the preceding claims wherein the second antigen is selected from the group consisting of: Nef, RT or a fragment containing an epitope of Nef or RT.
 - 13. Use according to any one of the preceding claims wherein the gag protein comprises p17.
- 14. Use according to claim 13 wherein the gag protein additionally30 comprises p24.

10

- 15. Use according to any one of the preceding claims wherein the gag sequence is codon optimised to resemble the codon usage in a highly expressed human gene.
- 5 16. Use according to any one claims 12 to 15 wherein the RT sequence or fragment thereof is codon optimised to resemble a highly expressed human gene.
 - 17. Use according to any one of the preceding claims wherein the nucleotide sequence encodes a Nef protein or epitope thereof.
 - 18. Use according to any one of the preceding claims wherein the nucleotide sequence is selected from the group
 - Gag (p17,p24) Nef truncate
 - Gag (p17,p24) (codon optimised) Nef (truncate)
- 15 Gag (p17,p24) RT Nef (truncate)
 - Gag (p17,p24) codon optimised RT Nef (truncate)
 - Gag (p17,p24) codon optimised RT codon optimised Nef truncate
- 19. Use according to any one of the preceding claims wherein the20 heterologous promoter is the minimal promoter from HCMV IE gene.
 - 20. Use according to claim 19 wherein the 5' of the promoter comprises exon 1.
- 25 21. Use according to any one of the preceding claims wherein the nucleic acid sequence is in the form of a double stranded DNA plasmid.
 - 22. Use according to any one of the preceding claims wherein the nucleic acid sequence encodes Gag (or a fragment thereof which comprises an epitope) and RT (or a fragment thereof which comprises an epitope) and Nef (or a fragment thereof which comprises an epitope) in any order.

- 23. Use according to claim 22 wherein wherein the nucleic acid encodes the proteins, or fragments thereof, in the sequence Nef-RT-Gag, RT-Nef-Gag or RT-Gag-Nef.
- 5 24. Use according to any one of the preceding claims wherein at least one of the proteins which is encoded by the nucleic acid is a fusion protein.
- 25. A product containing (i) a nucleic acid vaccine that comprises a nucleotide sequence that encodes an HIV-1 gag protein or fragment containing a gag epitope thereof and a second HIV antigen or a fragment encoding an epitope of said second HIV antigen, operably linked to a heterologous promoter, and (ii) a compound which is an imidazoquinoline amine, imidazopyridine amine, 6,7-fused cycloalkylimidazopyridine amine, 1,2-bridged imidazoquinoline amine, thiazolo- and oxazolo-quinolinamine or pyridinamine, imidazonaphthyridine or tetrahydroimidazonaphthyridine amine for sequential use, wherein the compound is administered topically or transdermally 12 to 36 hours after administration of the nucleic acid vaccine.
- 26. Method enhancing in an individual an immune response generated by a nucleic acid vaccine, said method comprising administering a compound which is an imidazoquinoline amine, imidazopyridine amine, 6,7-fused cycloalkylimidazopyridine amine, 1,2-bridged imidazoquinoline amine, thiazolo- or oxazolo-quinolinamine or pyridinamines, imidazonaphthyridine or tetrahydroimidazonaphthyridine amine,
- wherein the compound is administered topically or transdermally to the individual 12 to 36 hours after the nucleic acid vaccine is administered, and wherein the nucleic acid vaccine comprises a nucleotide sequence that encodes an HIV-1 gag protein or fragment containing a gag epitope thereof and a second HIV antigen or a fragment encoding an epitope of said second HIV antigen, operably linked to a heterologous promoter.

27. Method of preventing or treating HIV infection or AIDS comprising administering a nucleic acid vaccine that comprises a nucleotide sequence that encodes an HIV-1 gag protein or fragment containing a gag epitope thereof and a second HIV antigen or a fragment encoding an epitope of said second HIV antigen, operably linked to a heterologous promoter, and 12 to 36 hours subsequent to the administration of the nucleic acid vaccine administering a compound as defined in claim 26, wherein the compound is administered topically or transdermally.